

Date: Wednesday, 13/08/2008 10:55:06 AM
User: Julie Lecocq

Process Sheet

Customer :	CU-DAR001 Dart Helicopters Services	Drawing Name :	BLADE FITTING	
Job Number :	41206			
Estimate Number :	12300			
P.O. Number :		Part Number :	D3488042 041	
This Issue :	13/08/2008	S.O. No. :		
Prsht Rev. :	NC	Drawing Number :	D3488 / DSK101	
First Issue :	/ /	Project Number :	N/A	
Previous Run :	38787	Drawing Revision :	B / D	
Written By :		Material :		
Checked & Approved By :	JUL 08.8.13	Due Date :	15/09/2008	Qty: 20 Um: Each
Comment :	Est Rev:A New Issue 06-02-28 JLM Est Rev:B As per Rev B 06-03-30 JLM Est Rev:C Now On Doosan Lathe JLM Verified BY:DD			

Additional Product

Job Number:



Seq. #:	Machine Or Operation:	Description :
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1.0	D6103003	Round Billet, Aluminum
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Comment: Qty.: 1.0000 Each(s)/Unit Total : 20.0000 Each(s)
 Alluminum Round Billet D6103-003
 Batch: 841609

J.F. 08/09/11 (20)

2.0	DOOSAN LATHE	DOOSAN LATHE
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(P2) →

Comment: DOOSAN CNC LATHE
 1-Turn as per Dwg DSK 101 & Folio FA627

2-Deburr

J.F. 08/09/11 (20)

3.0	QC2	INSPECT PARTS AS THEY COME OFF MACHINE
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Comment: INSPECT PARTS AS THEY COME OFF MACHINE

J.F. 08/09/11 (20)

4.0	HAAS1	HAAS CNC VERTICAL MACHINING #1
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Comment: HAAS CNC VERTICAL MACHINING #1

1-Machine as per Folio FA627 & Dwg D3488

2-Deburr

JL 08/09/22

Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: D3488-041 PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____
 QA: N/C Closed: _____ Date: _____

NCR: <u>41206</u>		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			
8/8/08	#	One Blade fitting had chatter in Bottom of the zone. During Remain the inside dia has been oval sized to 2.172"	RF 06.09.08 QSR 042	ACCEPTABLE DEVIATION SEE ATTACHED EXCERPT FROM SR-D350-636-2 Rev B	JF. 08/09/08		RF 08.09.08 QSR 042	
		Suspected to be 2.170±0.005" EC chip was caught on Boring Bar.						

NOTE: Date & initial all entries

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Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: BLADE FITTING

Job Number: 41206

Part Number: D3488042 041

Job Number:



Seq. #:

Machine Or Operation:

Description :

5.0

QC2

INSPECT PARTS AS THEY COME OFF MACHINE



Comment: INSPECT PARTS AS THEY COME OFF MACHINE

J.L 08/09/22

6.0

QC8

SECOND CHECK



Comment: SECOND CHECK

SrB 08/09/22

7.0

HAND FINISHING1

HAND FINISHING RESOURCE #1



Comment: HAND FINISHING RESOURCE #1

Chemical Conversion Coat as per QSI 005 4.1

M-h

08/04/22

8.0

POWDER COATING

POWDER COATING



Comment: POWDER COATING

Powder Coat White Gloss (Ref: 4.3.5.1) as per QSI 005 4.3

START TIME:

OVEN TEMPERATURE:

FINISH TIME:

10:20
320:00
10:50

M-h

08/04/25

9.0

QC3

INSPECT POWDER COAT/CHEMICAL CONVERSION



Comment: INSPECT POWDER COAT/CHEMICAL CONVERSION

08:09-25

(20)

10.0

ALS71032225

INSERT



Comment: Qty.: 4.0000 Each(s)/Unit Total: 80.0000 Each(s)

Pick:

Qty Part Number Description Batch

4 ALS7-1032-225 Insert

M100 621

M-h

11.0

HAND FINISHING1

HAND FINISHING RESOURCE #1



Comment: HAND FINISHING RESOURCE #1

Install Inserts as per Dwg D3488

M-h

08/09/25

(20X)

Dart Aerospace Ltd

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: D3488-041 PAR #: N/A Fault Category: Prod/Machined Part NCR: Yes No DQA: D Date: 08/09/30
 QA: N/C Closed: D Date: 08/09/30

NCR: <u>41206</u>		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			
8/9/25	#80	Durbin powder coating it was noticed that all 80 we left none not Right HAND.	<i>[Signature]</i>	change all Qty <u>(80)</u> to - 041's.	<i>[Signature]</i> 08/09/25	<i>[Signature]</i> 08/09/25	<i>[Signature]</i>	<i>[Signature]</i>
		^{made} R.C operator made lefts with out checking	<i>[Signature]</i>	- train machinist to know different of Left and Right	J.F. 08/09/25	<i>[Signature]</i> 08/09/25	<i>[Signature]</i>	<i>[Signature]</i> 08/09/25

NOTE: Date & initial all entries

Date: Wednesday, 13/08/2008 10:55:06 AM
User: Julie Lecocq

Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: BLADE FITTING

Job Number: 41206

Part Number: D3488042041

Job Number:



Seq. #:

Machine Or Operation:

Description :

12.0

QC5

INSPECT WORK TO CURRENT STEP



Comment: INSPECT WORK TO CURRENT STEP

S 08/08/25 *20

13.0

PACKAGING 1

PACKAGING RESOURCE #1



Comment: PACKAGING RESOURCE #1

Identify and Stock

Location: _____

F-P-7

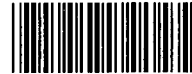
M-1

08/09/25

14.0

QC21

FINAL INSPECTION/W/O RELEASE



Comment: FINAL INSPECTION/W/O RELEASE

08/09/30

Job Completion



MF 08-09-30

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

QA: N/C Closed: _____ Date: _____

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

NOTE: Date & initial all entries

DART AEROSPACE LTD	Work Order: 41206
Description: Blade Fitting LH, RH	Part Number: 03488-1/2
Inspection Dwg: 03488, Rev: B	Page 1 of 1

FIRST ARTICLE INSPECTION CHECKLIST

Lathe (DOOSAW) ☒ First Article ☒ Prototype

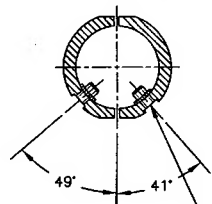
Drawing Dimension	Tolerance	Actual Dimension	Accept	Reject	Method of Inspection	Comments
Ø 2.150"	± .005"	Ø 2.150"				
Ø 2.780"	± .005"	Ø 2.780"				
Ø 3.125"	± .010"	Ø 3.125"				
Ø 3.346"	± .010"	Ø 3.346"				
.125 x 45°	± .010"	.115 x 45°				
8.000"	+ .030 - .030	8.000"				
9.250"	± .010"	9.250"				
.188"	± .010"	.188"				
R.032"	± .010"	R.032"				
R.062"	± .010"	R.062"				
Ø .297"	+ .005 - .001	Ø .299"				
Ø .430"	± .010"	Ø .432"				
.100"	± .010"	.105"				
.125"	± .010"	.127"				
2.620"	± .010"	2.619"				
3.500"	± .010"	3.500"				
1.005"	± .010"	1.004"				
Ø .484"	+ .005 - .001	Ø .485"				
1.180"	± .010"	1.181"				
3.150"	± .010"	3.151"				
3.070"	± .010"	3.070"				
8.000"	+ .030 - .030	8.005"				
R.063"	± .010"	R.063"				

Measured by: J.F.
Date: 08/09/11

Audited by: SP
Date: 08/09/22

Prototype Approval: N/A
Date:

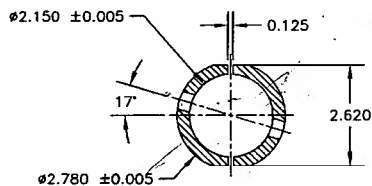
Rev	Date	Change	Revised by	Approved
A		New Issue	KJ/JLM	



SECTION B-B

Ø0.297
C'BORE Ø0.430 x 0.100
INSTALL ALS4-1032-225 (OR AKS4-1032-225
OR ALS7-1032-225 OR AKS7-1032-225)
INSERTS AFTER FINISH
(4 PLACES)

4



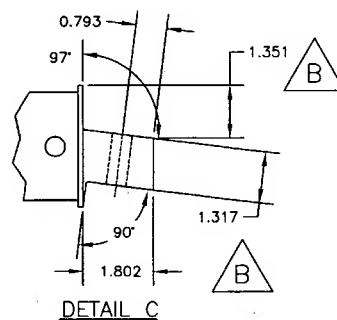
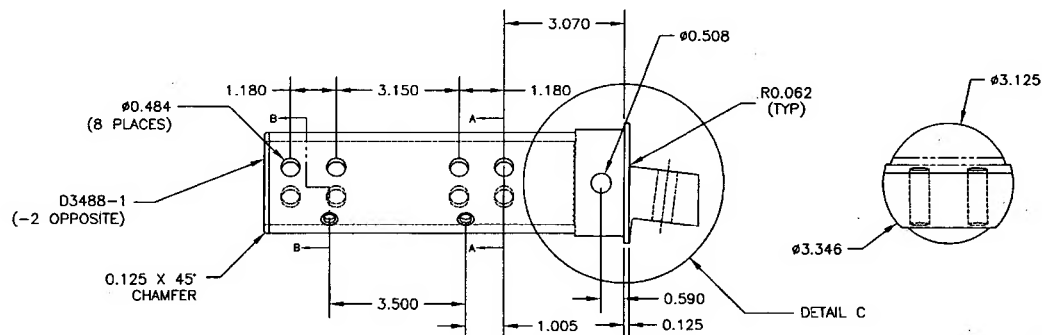
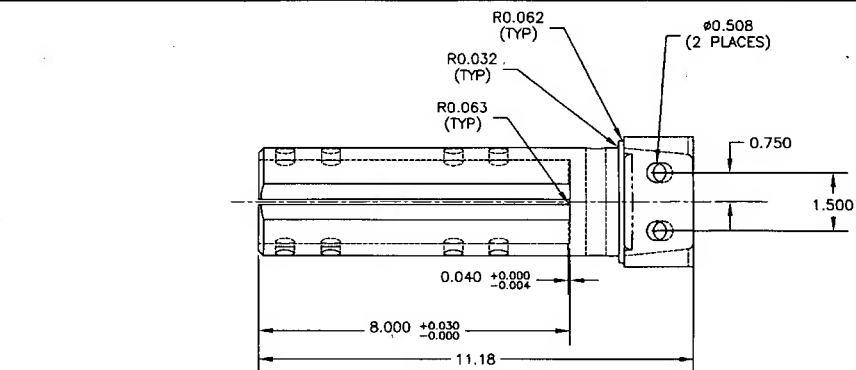
SECTION A-A

D3488-041/-042 BLADE FITTING ASSEMBLY PARTS LIST

QTY -041	QTY -042	PART NUMBER	DESCRIPTION
X	X	D3488-041	BLADE FITTING ASSEMBLY (LH)
		D3488-042	BLADE FITTING ASSEMBLY (RH)
1		D3488-1	BLADE FITTING (LH)
	1	D3488-2	BLADE FITTING (RH)
4	4	ALS4-1032-225 or AKS4-1032-225 or ALS7-1032-225 or AKS7-1032-225	INSERT

D3488-041/-042 BLADE FITTING

- MATERIAL: MAKE D3488-1/-2 FROM ALUMINUM 7075-T7351 ROUND BAR PER QQ-A-225/9 (REF. DART MATERIAL SPEC M7075T73R)
- FINISH: ACID ETCH, ALODINE PER DART QSI 005 4.1 POWDER COAT WHITE (REF 4.3.5.1) PER DART QSI 005 4.3
- BREAK UNMARKED SHARP EDGES 0.010 TO 0.020
- INSTALL INSERTS AFTER POWDER COAT
- ALL DIMENSIONS ARE IN INCHES
- TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED



DETAIL C

D3488-041 SHOWN (D3488-042 OPPOSITE)

RELEASED
06.03.15 PH
PER DS
ECN #739

B	06.03.15	CHANGE THICKNESS
A	05.12.20	NEW ISSUE
DESIGN	PH	DRAWN BY PH
CHECKED	#	APPROVED #
DATE	06.03.15	TITLE
		BLADE FITTING
		SCALE
		1:3

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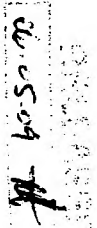
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DART DART AEROSPACE USA, INC.
PORT HADLOCK, WA

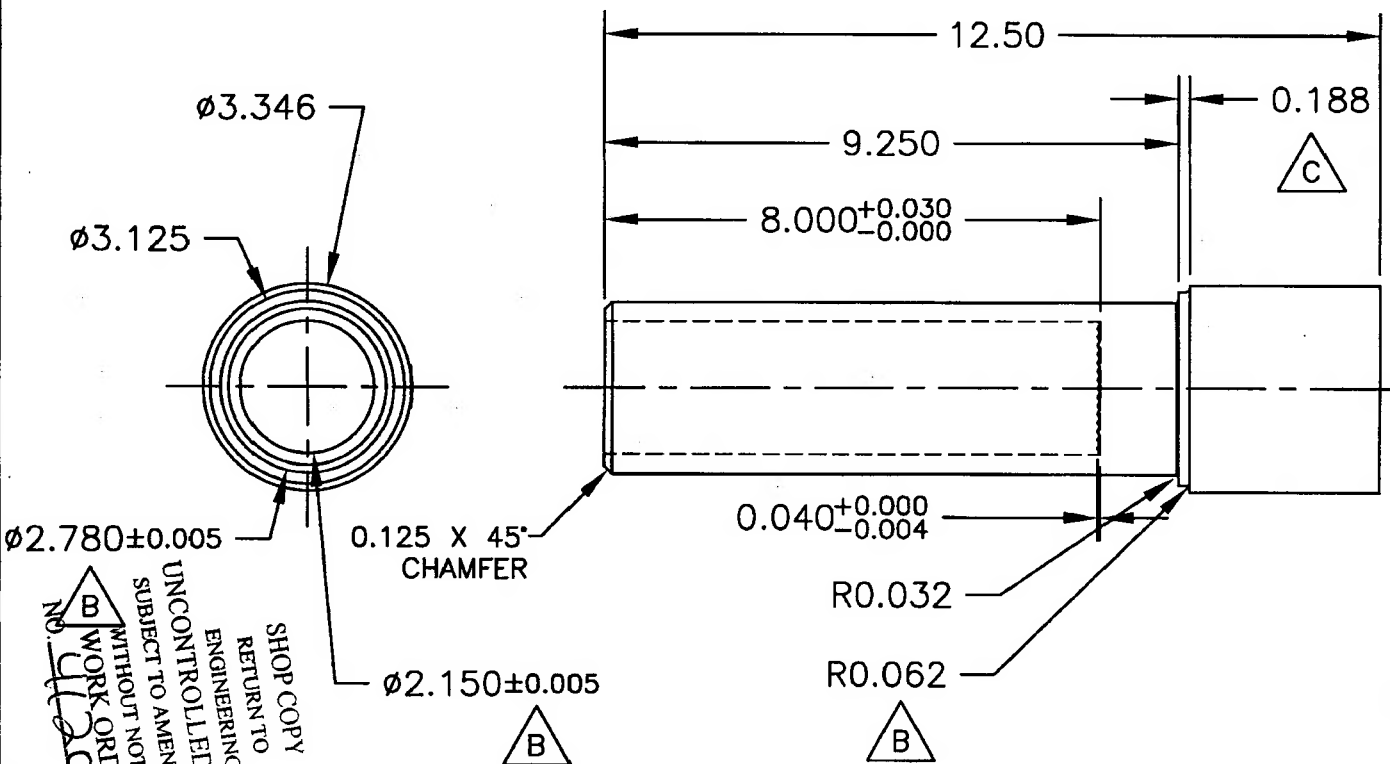
DRAWING NO. D3488
SHEET 1 OF 1

REV. B

NO. 47200
COPY TO AMENDMENT
CONTROLLED COPY
RETURN TO
ENGINEERING
WORK ORDER
WITH NOTICE



DESIGN	DRAWN BY		DART AEROSPACE USA, INC.	
	PH		PORT HADLOCK, WA	
CHECKED	APPROVED	DRAWING NO.	REV. D	
PH	PH	DSK 101	SHEET 1 OF 1	
DATE	TITLE		SCALE	
06.05.09	D3488-1/-2 TURNING DETAIL		1:3	
A	05.12.21	NEW ISSUE		
B	06.03.02	ADD TOLERANCES AND RADIUS		
C	06.04.17	0.188 WAS 0.125		
D	06.05.09	REMOVE DIAMETER FOR CHAMFER		



- 1) MATERIAL: MAKE FROM ALUMINUM 7075-T7351 ROUND BAR PER QQ-A-225/9
(REF. DART MATERIAL SPEC M7075T73R)
- 2) FINISH: NONE
- 3) BREAK UNMARKED SHARP EDGES 0.010 TO 0.020
- 4) ALL DIMENSIONS ARE IN INCHES
- 5) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED

SHOP COPY
RETURN TO
ENGINEERING
UNCONTROLLED COPY
SUBJECT TO AMENDMENT
WITHOUT NOTICE
WORK ORDER
NO. 4200
DSK

DART AEROSPACE USA, INC

SR-D350-636-2

Page 6 of 7

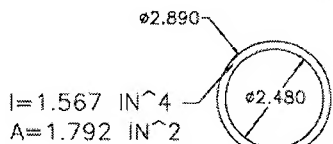
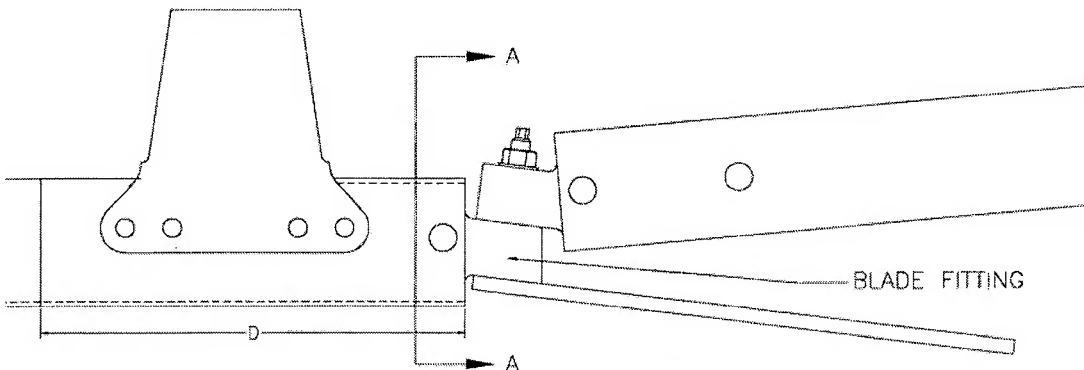
per DWG D3488, dim $\phi 2.780 \pm 0.005$ is $\phi 2.172$
2.150

For installation of the Apical Tri-bag and Apical Cylindrical Float bag systems onto OEM skid tubes; it is required that the OEM P/N 350A41-1077-24/-25 blade fitting be substituted with the Apical P/N 20473-7/-8 blade fitting. In the proposed Dart skid tube configuration, the Dart D3488-041/-042 blade fitting will replace the Apical P/N 20473-7/-8 blade fitting.

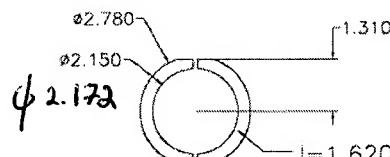
In the Dart system, blade fitting D3488-041/-042 will be used to transfer load into the web of the skid tube assembly. On the outside of the skid tube, D3488-041/-042 is dimensionally identical to the Apical P/N 20473-7/-8 blade fitting and is manufactured from the same 7075-T7351 material. Therefore, the Dart blade fitting and the Apical blade fitting have identical structural capability. The longitudinal location of the holes on the D3488-041/-042 blade fitting used to mount the aft crosstube are identical to the Apical P/N 20473-7/-8 blade fitting. On the inside of the skid tube, D3488-041/-042 has been designed to withstand higher bending moments than the Apical fitting.

The following table compares the Dart D3488-041/-042 blade fitting to the Apical 20473-7/-8 blade fitting.

Component	Dart D3488-041/-042	Apical P/N 20473-7/-8
Material	7075-T7351 per QQ-A-225/9	7075-T7351 per QQ-A-225/9
(I) Moment of Inertia of portion inside skid tube	1.620 in ⁴ (from D3488-041/-042 dwg)	1.567 in ⁴ (from D20473-7/-8 dwg)
(C) Distance to outer fibers	1.310 in (from D3488-041/-042 dwg)	1.445 in (from 20473-7/-8 dwg)
(A) Area at section A-A	2.280 in ²	1.792 in ²
Z=I/C at section A-A	1.234 in ³	1.084 in ³
D	10.69 in	10.53 in



SECTION A-A
APICAL P/N
20473-7/-8
BLADE FITTING



SECTION A-A
DART P/N
D3488-041/-042
BLADE FITTING

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Conclusion: Since I/C, A, D is still greater than Apical
P/N 20473-7/-8.
Part is structurally ACCEPTABLE

Revision: B
Date: 06.02.23